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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,532	11/06/2003	Jae Sun Lee	27427.010.00-US	8153
30827	7590	09/01/2005	EXAMINER	
MCKENNA LONG & ALDRIDGE LLP 1900 K STREET, NW WASHINGTON, DC 20006			WON, BUMSUK	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/701,532	<b>Applicant(s)</b> LEE, JAE SUN	
	<b>Examiner</b> Bumsuk Won	<b>Art Unit</b> 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/6/2003</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Specification*

2. The disclosure is objected to because of the following informalities: Inequality signs are missing on page 9, line 3. Appropriate correction is required.
3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Cathode structure for color cathode ray tube having specific dimensions for sleeve, base metal, holder, and strap.

### *Claim Objections*

4. Claim 1 objected to because of the following informalities: Inequality signs are missing in the last line of claim 1. Appropriate correction is required.

*Claim Rejections - 35 USC § 112*

5. Claims 2-11, 14-19, and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "about" in claims 2-11, 14-19, and 21 is a relative term which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Appropriate correction is required.

*Claim Rejections - 35 USC § 102*

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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7. Claims 1-2, 4-6, 19, and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Schlack (US 4,782,426).

Regarding claims 1-2, 19, 21-22 Schlack discloses a cathode structure for a cathode ray tube comprising: a sleeve (note figure 3, item 18) with a built-in heater (note figure 3, item 23); a base metal (note figure 3, item 20) covered with an electron-emissive material (note figure 3, item 22), the base metal being fixed to an upper end portion of the sleeve (note figure 3); and a holder (note figure 3, item 24) for encompassing the sleeve, wherein H denotes a height of the cathode structure, C denotes a height of the base metal, D denotes a length of the holder, and H, C, and D satisfy the condition of  $H < (C + D)$ .

Schlack discloses H is 8.76 mm (note column 2, line 48, and figure 3, item L), C is at least 0.635 mm (note column 2, line 46, and figure 3, item I). Figure 3 shows that lower end of base metal (note figure 3, item 20) is lower than upper end of holder (note figure 3, item 24). Therefore,  $H - (C + D)$  is always going to be less than 0.

Regarding claim 4, Schlack discloses the cathode structure as claimed in claim 1, wherein height, C, of the base metal is greater than or equal to about 0.5 mm (note column 2, line 46, and figure 3, item I).

Regarding claim 5, Schlack discloses the cathode structure as claimed in claim 1, wherein the height, C, of the base metal is in the range of about 0.6 mm to about 1.1 mm (note column 2, line 46, and figure 3, item I).

Regarding claim 6, Schlack discloses the cathode structure as claimed in claim 1, wherein the length, D, of the holder is in the range of about 4.5 mm to about 8.0 mm.

Schlack discloses that depending on the height of the base metal, C, D can be any range that is smaller than 8.125 mm.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlack (US 4,782,263) in view of Lee (US 5,164,631).

Regarding claim 3, Schlack discloses all of the claimed limitations except for the cathode structure as claimed in claim 1, wherein a length, B, from a lower end of the base metal to a lower end of the sleeve is in the range of about 2.5 mm to about 4.0 mm.

Lee discloses a length from a lower end of the base metal to a lower end of the sleeve is in the range of about 1.8 mm to 3.3 mm (note figure 2, item C), for the purpose of increasing cathode temperature in order to reduce power consumption (note column 2, lines 43-53, and figure 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the a length from a lower end of the base metal to a lower end of the sleeve is in the range of about 1.8 mm to 3.3 mm disclosed by Lee in

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cathode structure disclosed by Schlack, for the purpose of increasing cathode temperature in order to reduce power consumption.

Regarding claim 12, Lee discloses the length from a lower end of the base metal to an upper end of the sleeve, F, and the length from the upper end of the sleeve to an upper end of the holder, G, satisfies a relation of  $G > D$  (note figure 1)

The reason for combining is the same as for claim 3 above.

10. Claims 7-8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlack (US 4,782,263) in view of Koizumi (US 6,504,293).

Regarding claim 7, Schlack discloses all of the claimed limitations except for the length, F, from an upper end of the sleeve to a lower end of the base metal is in the range of about 0.25 mm to about 0.85 mm.

Koizumi discloses height of the base metal (note figure 4, item h) is 0.5 mm and the thickness of the base metal top (note figure 4, item t1) is in the range of 0.083 mm to 0.25 mm (note column 5, lines 14-21, and figure 4). Therefore, the length F is in the range of 0.25 mm to 0.417 mm, which is in the range of  $0.25 \text{ mm} \leq F \leq 0.85 \text{ mm}$ .



It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the length F to be in the range of 0.25 mm to 0.417 mm disclosed by Koizumi in cathode structure disclosed by Schlack, for the purpose of having enough contacting surface are between base metal and sleeve to achieve higher heat transfer efficiency.

Regarding claim 8, Schlack discloses the length from a lower end of the base metal to an upper end of the holder is less than 0 (Figure 3 shows that lower end of base metal (note figure 3, item 20) is lower than upper end of holder (note figure 3, item 24)).

Koizumi discloses the length from an upper end of the sleeve to a lower end of the base metal is in the range of 0.25 mm to 0.417 mm, therefore, the length from an upper end of the sleeve to an upper end of the holder is less than 0.417 mm, which is in the range of  $0.4 \text{ mm} \leq G \leq 0.8 \text{ mm}$ .

The reason for combining is the same as for claim 7 above.

Regarding claim 11, Koizumi discloses the length of an upper portion (thickness) of the base metal is in the range of 0.083 mm to 0.25 mm (note column 5, lines 14-21, and figure 4, item t1) which is in the range of  $0.05 \text{ mm} \leq \text{thickness} \leq 0.25 \text{ mm}$ .

The reason for combining is the same as for claim 7 above.

11. Claims 9-10, 13-18, 20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlack (US 4,782,263) in view of Nakamura (US 6,242,852).

Regarding claim 9, Schlack discloses all of the claimed limitations except for a length, S, of the sleeve is in the range of about 2.9 mm to about 5.5 mm.

Nakamura discloses the length of the sleeve is in the range of 3 mm to 6 mm (note column 3, lines 64-67, and figure 6A, item I), which is in the range of 2.9 mm to 5.5 mm, for the purpose of reducing the caloric amount propagating to grid electrodes due to thermal conduction and thermal radiation and reducing the power consumption of a heater (note column 2, lines 42-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the length of the sleeve in the range of 2.9 mm to 5.5 mm

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disclosed by Nakamura in the cathode structure disclosed by Schlack, for the purpose of reducing the caloric amount propagating to grid electrodes due to thermal conduction and thermal radiation and reducing the power consumption of a heater.

Regarding claim 10, Nakamura discloses the difference between inside diameter,  $D_h$ , of the holder (note column 4, lines 15-18, " 2.2 mm to 2.6 mm" , and figure 6A, item D1) and an outside diameter,  $D_s$ , of the sleeve (note column 3, lines 62-64, " 1.0 mm to 1.4 mm" , and figure 6A, item d), namely ( $D_h - D_s$ ), is in the range of about 0.8 mm to about 1.6 mm, which is in the range of 0.6 mm to 0.9 mm.

The reason for combining is the same as for claim 9 above.

Regarding claims 13, 20, and 23, Nakamura discloses a strap (note column 4, lines 29-34, "tab", and figure 6A, item 29) for fixing the sleeve (note figure 6A, item 10) inside the holder (note figure 6A, item 20a).

The reason for combining is the same as for claim 9 above.

Regarding claim 14, Nakamura discloses a height, A, of a strap welding point from a lower end of the sleeve is not larger than about 1.0 mm (note column 4, lines 31-34, "to the base end of the inner sleeve", and figure 6A).

The reason for combining is the same as for claim 9 above.

Regarding claim 15, Nakamura discloses a length, R, of the strap is in the range of 1.9 mm to 3.1 mm. Nakamura discloses the length of the sleeve is between 3 mm to 6 mm. Figure 6A shows that the strap affixed portion is about 1/3 of the length of the sleeve, and the length between diameter of inner sleeve to holder is in the range of 0.8 mm to 1.6 mm. Using Pythagorean theorem, the length, R, of the strap is in the range of 2.15 mm to 4.31 mm, which is within the range of 3 mm to 6 mm.

The reason for combining is the same as for claim 9 above.

Regarding claims 16 and 17, Nakamura discloses a ratio of length of the strap, R, to a length of the sleeve, S, namely  $R/S$ , is in the range of 60% to 80%. Nakamura discloses the length of strap is 2.15 mm to 2.56 mm when the length of sleeve is 3 mm, thus, the ratio  $R/S$  is in the range of 72% to 85% which is in the range of 60% to 80%.

The reason for combining is the same as for claim 9 above.

Regarding claim 18, Nakamura discloses the point at which the strap is affixed to the sleeve is located at or above a distance from a lower end of the sleeve which is equal to about 1/3 of the length of the sleeve (note figure 6A, items 10 and 29).

The reason for combining is the same as for claim 9 above.

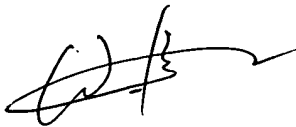
*Contact information*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bumsuk Won whose telephone number is 571-272-2713. The examiner can normally be reached on Monday through Friday, 8:00 am to 5:00 pm.

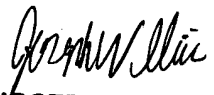
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Bumsuk Won  
Patent Examiner

  
**JOSEPH WILLIAMS**  
**PRIMARY EXAMINER**